

1 CLAIMS:

1. In a system comprising a communications network connecting a plurality
of network servers and a plurality of computers, a network server comprising:

5 a verification database comprising;

at least one master table of contents identifier corresponding to each of
a plurality of sets of digitized content; and

10 at least one master songprint identifier corresponding to each of the
plurality of sets of digitized content; and

wherein the network server is programmed to;

15 receive at least one of a plurality of selections of table of contents
identifiers from at least one of the plurality of computers;

receive at least one of a plurality of songprint identifiers from the at least
one of the plurality of computers.

20 2. The server of claim 1, further programmed to receive one selection of
table of content identifiers from the at least one of the plurality of computers.

25 3. The server of claim 1, further programmed to receive a songprint
identifiers from the at least one of the plurality of computers.

30 4. The server of claim 1, wherein the table of content identifiers comprised
of a concatenation of the lengths of the sets of digitized content.

35 5. The server of claim 1, further programmed to request at least one of a
plurality of regions of digitized content from the at least one of the plurality of
computers.

1 6. The server of claim 5, further programmed to request one region of
digitized content from the at least one of the plurality of computers.

5 7. The server of claim 5, wherein the request for one or more regions of
digitized content is generated as a function of a pseudo-random sequence.

10 8. The server of claim 7, wherein the pseudo-random sequence is a function
of a network address of the at least one of the plurality of computers.

15 9. The server of claim 7, wherein the pseudo-random sequence is a function
of the time of day.

20 10. The server of claim 7, wherein the pseudo-random sequence is a function
of both a network address of at least one of the plurality of computers and the time of
day.

25 11. The server of claim 7, wherein the request for regions of digitized content
is further comprised of a request for at least one of a plurality of decoy regions of
digitized content from the at least one of the plurality of computers.

30 12. The server of claim 11, wherein the request for a at least one of a plurality
of decoy regions of digitized content is a function of a pseudo-random sequence.

35 13. The server of claim 12, wherein the pseudo-random sequence is a
function of a network address of the at least one of the plurality of computers.

1 14. The server of claim 12, wherein the pseudo-random sequence is
comprising a function of the time of day.

5 15. The server of claim 12, wherein the pseudo-random sequence is
comprising a function of both a network address of the at least one of the plurality of
computers and the time of day.

10 16. The server of claim 11, wherein the request for one or more than regions
of digitized content is further comprised of only one non-decoy region of digitized
content from the at least one of the plurality of computers.

15 17. The server of claim 1, wherein the verification database is further
comprised of only one master table of contents identifier for each of a corresponding
plurality of sets of digitized content.

20 18. The server of claim 1, wherein the verification database is further
comprised of only one master songprint identifier for each of a corresponding plurality
of sets of digitized content.

25 19. The server of claim 1, further programmed to verify whether the received
table of content identifier correlates with the master table of content identifier.

30 20. The server of claim 1, further programmed to verify whether the received
table of content identifiers correlates perfectly with the master table of content identifier.

1 21. The server of claim 1, further programmed to verify whether the received
songprint identifiers correlates with the master songprint identifier.

5 22. The server of claim 1, further programmed to verify whether the received
songprint identifier correlates perfectly with any master songprint identifier.

10 23. In a system comprising a communications network connecting a plurality
of network servers and a plurality of computers, a network server comprising:

a verification database comprising;

at least one master table of contents identifier corresponding to each of
a plurality of sets of digitized content; and

at least one master songprint identifier corresponding to each of the
plurality of sets of digitized content; and

wherein the network server is programmed to;

receive at least one of a plurality of selections of table of contents
identifiers from at least one of the plurality of computers;

receive at least one of a plurality of selections of songprint identifiers from
the at least one of the plurality of computers; and

as a function of whether or not the received selections of table of content
identifiers correlate with the master table of content identifier, request at least
one of a plurality of regions of digitized content from the at least one of plurality
of computers.

30 24. The network server of claim 23, further programmed to verify whether the
received selections of table of content identifiers correlates perfectly with the master
table of content identifiers.

1 25. In a system comprising a communications network connecting a plurality
of network servers and a plurality of computers, a network server comprising:
a verification database comprising;

5 at least one master table of contents identifiers corresponding to each of
a plurality of sets of digitized content; and

10 at least one master songprint identifier corresponding to each of a plurality
of sets of digitized content; and

15 wherein the network server is programmed to;

20 receive at least one of a plurality of selections of table of contents
identifiers from at least one of the plurality of computers;

25 receive at least one of a plurality of selections of songprint identifiers from
the at least one of the plurality of computers; and

30 as a function of whether or not the received selections of songprint
identifiers correlate with any of the master table of content identifiers, request at
least one region of digitized content from the at least one of plurality of
computers.

35 26. The network server of claim 25, further programmed to verify whether the
received selections of songprint identifiers correlate perfectly with any of the master
table of content identifiers.

40 27. In a system comprising a communications network connecting a plurality
of network servers and a plurality of computers, a network server comprising:

45 a verification database comprising;

50 at least one master table of contents identifier corresponding to each of
a plurality of sets of digitized content; and

1 at least one master songprint identifier corresponding to each of a plurality
of sets of digitized content;
wherein the network server is programmed to;
5 receive at least one of a plurality of selections of table of contents
identifiers from at least one of the plurality of computers;
 receive at least one of a plurality of selections of songprint identifiers from
the at least one of the plurality of computers; and
10 as a function of whether or not the received selections of table of contents
identifiers and selections of songprint identifiers correlate with any of the plurality
of master table of content identifier, request at least one of a plurality of regions
of digitized content from the at least one of plurality of computers.

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20 28. The network server of claim 27, further programmed to verify whether the
received selections of table of content identifiers correlate perfectly with the master
table of content identifiers and the received selections of songprint identifiers correlate
perfectly with the master songprint identifiers.

25 29. In a system comprising a communications network, at least one of a
plurality of network servers comprised of a verification database comprising at least one
master table of contents identifier corresponding to each of a plurality of sets of digitized
content and at least one master songprint identifier corresponding to each of a plurality
of sets of digitized content and at least one of a plurality of computers, the method of
30 identifying digitized content stored on a medium comprising the steps:

 the network server receiving at least one of a plurality of selections of table of
contents identifiers from at least one of the plurality of computers; and,

1 the network server receiving at least one of a plurality of selections of songprint
identifiers from at least one of the plurality of computers.

5 30. The method of claim 29, wherein the step of receiving at least one of a
plurality of selections of table of contents identifiers comprises receiving one selection
of table of content identifiers from the at least one of the plurality of computers.

10 31. The method of claim 29, wherein the step of receiving at least one of a
plurality of selections of songprint identifiers comprises receiving one selection of
songprint identifiers from the at least one of the plurality of computers.

15 32. The method of claim 29, further including the step of verifying whether one
of the received selections of table of content identifiers correlates with any of the master
table of content identifiers.

20 33. The method of claim 29, further including the step of verifying whether one
of the received selections of table of content identifiers correlates perfectly with any of
the master table of content identifiers.

25 34. The method of claim 29, further including the step of verifying whether one
of the received selections of songprint identifiers correlates with any of the master
songprint identifiers.

30 35. The method of claim 29, further including the step of verifying whether one
of the received selections of songprint identifiers correlates perfectly with any of the
master songprint identifiers.

1 36. In an electronic device containing one or more sets of digitized content
stored on a medium, the method of generating table of contents identifiers comprising
the steps:

- 5 reading table of contents data from the medium;
computing a cryptographic hash value of the concatenation of the lengths of
each track on the medium; and
truncating the cryptographic hash value.

10 37. In an electronic device containing one or more sets of digitized content
stored on a medium, the method of generating a songprint identifier comprising the
steps:

- 15 averaging the two stereo channels of the digitized content to produce a single
channel;
dividing the songprint region into chunks of predetermined size;
discarding any partial chunks;
de-trending each chunk;
windowing each chunk;
calculating spectral components for each chunk;
25 computing a first portion of the songprint identifier; and
computing a second portion of the songprint identifier;

30 38. The method of claim 37, wherein the step of windowing each chunk
further comprises a Hanning window.

35 39. The method of claim 37, wherein the step of calculating spectral
components for each chunk further comprises a Fast Fourier Transform function.

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40. The method of claim 37, wherein the step of computing a first portion of
the songprint identifier further comprising of calculating the mean of corresponding
spectral components from each chunks.

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41. The method of claim 37, wherein the step of computing a second portion
of the songprint identifier is further comprised of calculating the standard deviation of
10 corresponding spectral components from each chunk.

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42. In a system comprising a communications network, at least one of a
plurality of network servers comprised of a verification database comprising at least one
master table of contents identifiers for each of a corresponding plurality of sets of
digitized content, the master table of contents identifier further comprised of data stored
in fields, and least one plurality of computers comprising at least one of a plurality of
sets of digitized content, the method of selecting sets of digitized content from the
20 verification database comprising the steps:
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the network server sorting the verification database by fields contained in
the master table of contents identifiers;

receiving at least one table of contents identifier from at least one of the
plurality of computers;

extracting data from the at least one received table of contents identifiers
corresponding to the field used in the sort;

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selecting an entry in the sorted verification database containing data in
the field used in the sort that best matches the extracted data;
determining if the neighboring data in the sorted verification database is within
a specified limit from the extracted data; and
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1 selecting all entries in the sorted verification database containing data in the file
used in the sort that is within the specified limit from the extracted data.

5 43. The method of claim 42, wherein the step of sorting the verification
database by fields is further comprised of sorting based on the medium length.

10 44. The method of claim 42, wherein the step of sorting the verification
database by fields is further comprised of sorting based on the length of the first
digitized content.

15 45. The method of claim 42, wherein the step of sorting the verification
database by fields is further comprised of sorting based on the length of the last
digitized content.

20 46. The method of claim 42, wherein the step of sorting the verification
database by fields is further comprised of sorting based on the length of the longest
digitized content.

25 47. The method of claim 42, wherein the step of sorting the verification
database by fields is further comprised of sorting based on the length of the shortest
digitized content.

30 48. In a system comprising a communications network, at least one of a
plurality of network servers comprised of a verification database comprising at least one
master songprint identifier for each of a corresponding plurality of sets of digitized
content, and least one of a plurality of computers comprising at least one of a plurality
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1 of sets of digitized content, the method of selecting sets of digitized content from the
verification database comprising the steps:

5 receiving at least one of a plurality of songprint identifiers from at least
one of the plurality of computers;

computing the root-mean-square difference between the master songprint
identifier and the received plurality of songprint identifiers; and

10 selecting the sets of digitized content corresponding to the master
songprint identifier in the verification database that has the smallest root-mean-
square difference.

15 49. In a system comprising a communications network, at least one of a
plurality of network servers comprised of a verification database comprising at least one
master table of contents identifier comprised of data stored in fields, and at least one
master songprint identifier for each of a corresponding plurality of sets of digitized
content, and least one of a plurality of computers comprising at least one of a plurality
20 of sets of digitized content, the method of selecting sets of digitized content from the
verification database comprising the steps:

25 the network server sorting the verification database by fields contained in
the master table of contents identifiers;

receiving at least one table of contents identifier from at least one of the
plurality of computers;

30 receiving at least one songprint identifier from the at least one of the
plurality of computers;

extracting data from the at least one received table of contents identifier
corresponding to the field used in the sort;

1 selecting a best matched entry from the sorted verification database
containing data in the field used in the sort that best matches the extracted data;

5 selecting entries in the sorted verification database neighboring the best
matched entry containing data in the field used in the sort within a specified limit
from the extracted data; and

10 computing the root-mean-square difference between the at least one
received songprint identifier and the master songprint identifier in the sorted
verification database corresponding to the selected best matched entry and
selected neighboring entry; and

15 selecting the sets of digitized content corresponding to the master
songprint identifier in the verification database that has the smallest root-mean-
square difference.

20 50. In a system comprising a communications network, at least one of a
plurality of network servers comprised of a verification database comprising at least one
of a plurality of master hash data identifiers generated randomly from each of a
corresponding plurality of sets of digitized content, and least one of a plurality of
computers comprising at least one of a plurality of sets of digitized content, the method
25 of verifying the sets of digitized content comprising the steps:

the network server receiving data from one of the plurality of computers;
calculating a hash data identifier for the received data; and
computing the difference between the calculated hash data identifier and
30 the master hash data identifier in the verification database.

35 51. The method of claim 50, wherein the step of computing the difference is
further comprised of computing the difference between the root-mean-square of the

1 calculated hash data identifier and the root-mean-square of the master hash data
identifier in the verification database.

5 52. In a system comprising a communications network, at least one of a
plurality of network servers comprised of a verification database comprising at least one
of a plurality of master songprints generated randomly from each of a corresponding
plurality of sets of digitized content, and least one of a plurality of computers comprising
10 at least one of a plurality of sets of digitized content, the method of verifying the sets of
digitized content comprising the steps:

15 the network server receiving data from at least one of the plurality of
computers;

20 calculating a songprint identifier for the received data; and

25 computing the root-mean-square difference between the calculated
songprint identifier and the master songprint identifier in the verification
database.

30 53. In a system comprising a communications network, at least one of a
plurality of network servers comprised of a verification database comprising at least one
of a plurality of master hash data identifiers and at least one of a plurality of master
songprints generated randomly from each of a corresponding plurality of sets of
digitized content, and least one of a plurality of computers comprising at least one of
a plurality of sets of digitized content, the method of verifying the sets of digitized
content comprising the steps:

35 the network server receiving data from one of the plurality of computers;
calculating a hash data identifier for the received data;

1 computing the difference between the calculated hash data identifier and
the master hash data identifier in the verification database; and

5 computing the root-mean-square difference between the calculated
songprint identifier and the master songprint identifier in the verification
database.

54. The method of claim 53, wherein the step of computing the difference is
10 further comprised of computing the difference between the root-mean-square of the
calculated hash data identifier and the root-mean-square of the master hash data
identifier in the verification database.

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